

**CLIMATIC CHANGES OF THE LAST 450 YEARS RECORDED IN THE SKELETON OF THE CORALLINE DEMOSPONGE *ASTROSCLERA WILLEYANA*.** *Memoirs of the Queensland Museum* 44: 658. 1999:- Stable isotope time series of  $\delta^{18}\text{O}$  and  $\delta^{13}\text{C}$  were measured in successive growth layers of the largest and oldest *Astrosclera* ever found (diameter of 25cm, max. age 550yrs) from Ribbon Reef #10 (GBR) (Wörheide et al., 1997; Wörheide, 1998). *Astrosclera* forms its skeletal aragonite in equilibrium with the ambient seawater, and represents, therefore, a high precision recorder of the isotopic history of the ambient seawater.  $\delta^{13}\text{C}$  of surface water dissolved inorganic carbon in the northern Great Barrier Reef has apparently decreased continuously since the mid-16<sup>th</sup> century. The total decrease is 0.7‰. The major decline of 0.5‰ occurred during the industrial period of the 19th and 20th century, likely to be due to the increased release of  $\text{CO}_2$  by deforestation and burning of fossil fuel during the period of industrialization after 1850 (increased input of lighter carbon isotopes). The oxygen isotope history shows a slightly colder (and/or dryer) phase before 1850, which correlates with the 'Little Ice Age'. A considerable shift to lighter values occurred during the 20th century (warming of SST). This may be due to an anthropogenic greenhouse effect. Most of the major climatic changes caused by ENSO/El Niño events, as reported by Quinn et al. (1987), as well as by large volcano eruptions (see LaMarche & Hirschbroek, 1984) in the last four and a half centuries seem to be recorded in the oxygen isotope record of *Astrosclera*. Further, more detailed isotope analyses on replicate samples are needed to

corroborate present preliminary data. □ *Porifera*, *Astrosclera*, growth layers, isotopes  $\delta^{18}\text{O}$  and  $\delta^{13}\text{C}$ , seawater.

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